

Taxonomic Notes on Indian Species of *Anisadenia* (*Linaceae*)

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Further revision of *Anisadenia* Wall. ex Meisn. (*Linaceae* : tribe *Eulineeae* Hook. f.) is presented. This includes correction in the designation of lectotype for *A. saxatilis* Wall. ex Meisn. and *A. pubescens* Griff. and further notes on the delimitation for both species with a revised key.

Key words: *Anisadenia pubescens*, *Anisadenia saxatilis*, lectotypification, *Linaceae*.

Anisadenia Wall. ex Meisn. (*Linaceae*) is represented by two species and is distributed in the subtropical and temperate zones of the Himalayas (India and Nepal) and China (Mabberley 2008). Hooker (1874) placed *Anisadenia* under the tribe *Eulineeae*, characterised as herbs or undershrubs, petals contorted and the number of stamens equaling to those of the petals. He reported two species viz., *Anisadenia saxatilis* Wall. ex Meisn. from central and eastern temperate Himalaya (Nepal, Sikkim and the Khasia mountains at an altitude of 5000–6000 ft.) and *A. pubescens* Griff. from the Khasia mountains at an altitude of 5000–6000 ft. Subsequently, Hajra (1983, 1993) provided a key to both species and taxonomic description show overlapping taxonomic parameters resulting in taxonomic ambiguity for delimiting these taxa at specific level. Both species show stems leafy throughout or towards apex on which distinction has been made earlier and it is suggested that this parameter will no longer be considered for the delimitation of these two taxa. During the present study the authors critically examined all

the collections including type material available in CAL and other herbaria which provided clear morphological differentiation and finally established the distinction of these two species.

Anisadenia saxatilis clearly differs from *A. pubescens* in the distinctions as follows: lower part of the stem creeping, rooting at base, leaves larger, whorled at the apex of the stem or widely apart, glabrous above, sparingly pubescent beneath, nectar gland one, petioles comparatively larger, petals white. In *A. pubescens*: stem straight, leaves smaller, arranged throughout stem or sometimes whorled at one point, appressedly silky hairy above, whitish villous beneath, nectar glands five, petiole shorter and petals pink in the latter (Fig 1). A revised key to both species is also being provided below.

Keys to the species

- 1a. Stem pubescent; leaves shortly petiolate; leaf blade abaxially appressedly silky-hairy, adaxially whitish tomentose; petals pink; nectar glands 5 *A. pubescens*
- 1b. Stem glabrous or sparingly pubescent; petiole

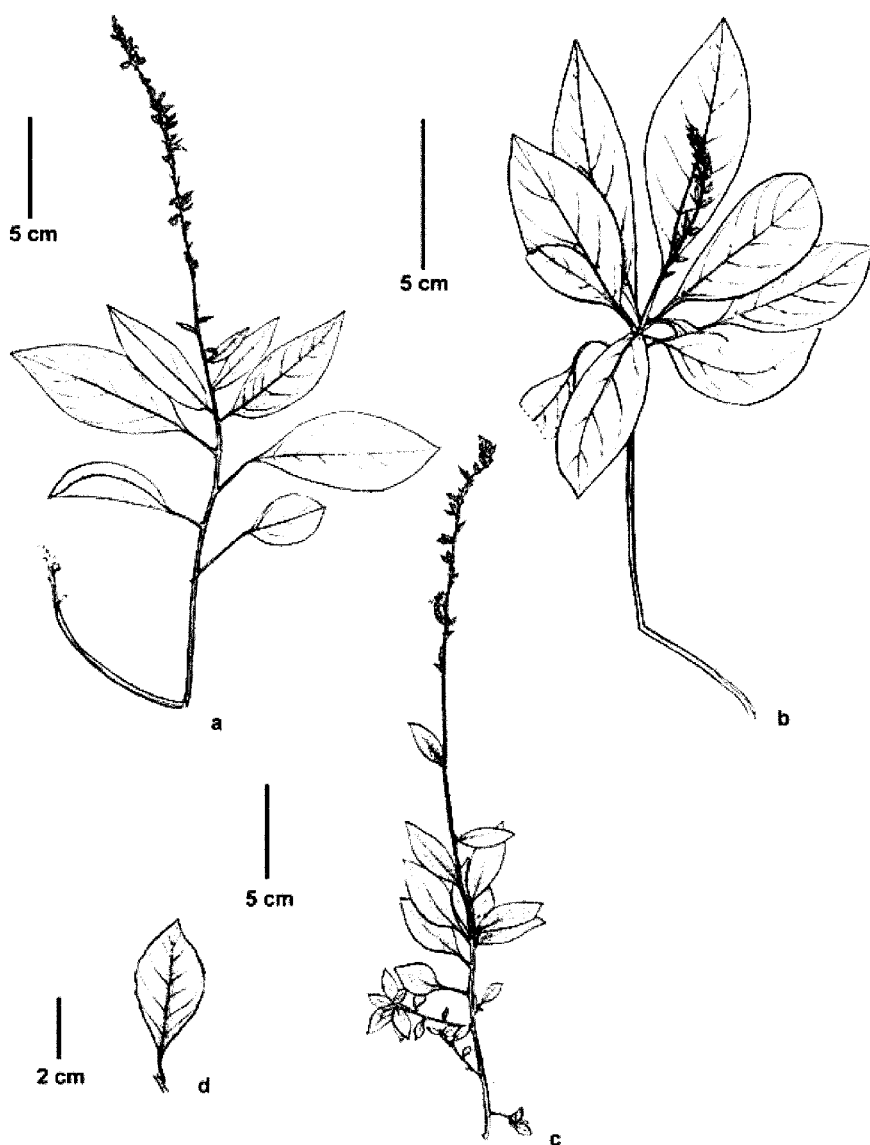


Fig. 1. *Anisadenia saxatilis* (a–b). a. Plant leafy throughout the stem (drawn from West Bengal, Darjeeling, B. B. Oswestre s.n., CAL). b. Plant leafy somewhat whorled at tip (drawn from Khasi, Hooker f. & Thomson s.n., CAL). *A. pubescens* (c–d). c. Pubescent twig. d. Lower surface of leaf (c & d drawn from Khasia Hill, June 1850, no collector's name s.n., CAL).

longer; leaf blade glabrous or sparingly pubescent on both sides; petals white; nectar gland 1 *A. saxatilis*

Hajra (1983) mentioned that the type of *A. pubescens* from Khasia was collected by Griffith (CAL) and the type of *A. saxatilis* was

from Sheopore, Nepalia, August 1821 (CAL) which can be considered as a first step in typification and it further requires narrowing to single specimens among all available specimens through subsequent lectotypification (cf. Art. 9.15 of Vienna Code; McNeill et al. 2006). During regular checking of herbarium specimens

for preparing database of the herbarium holdings from the general and type section in CAL, the type specimens of both species were found at CAL. The detailed scrutiny of the protologue and relevant literature (Hooker 1874, Hajra 1983, 1993) aroused a curiosity to lectotypify both the existing species known to occur in the Himalayan region in India and Nepal as no second step typification of these species has been carried out after Hajra (1983). The type images of both the taxa have been procured as available from different herbaria viz., K, L, P, OXF, E, PH and NY. While carrying out typification of both the *Anisadenia* species, authors have critically examined the type images of all the available specimens deposited in various herbaria. The formal typification and synonymy have been summarized below.

Taxonomic treatments

Anisadenia saxatilis Wall. ex Meisn., Pl. Vase. Gen. Comment. 2: 96 (1838); Hook. f., Fl. Brit. Ind. 1: 412 (1874); Hajra in Fasc. Fl. Ind. 13: 3 (1983) & Fl. Ind. 3: 573 (1993).

Lectotypus (designated here): Specimen 'No. 2'. INDIA. Uttarakhand, East Kumaon Wall. Cat. 1510 B, R. Blinkworth s.n. (CAL 6759 !).

[Fig. 2]

Syntypus: Nepalia (Nepal), Sheopore, August 1821, Wall. Cat. 1510, Wallich s.n. (CAL 6758 !); Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (P 689861 !); Specimens 2–6 (clockwise from lower left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (P 689862 !); Specimens 7–17 (clockwise from lower left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (P 689860 !); Specimens 1–3 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (OXF 96140 !); Specimens 1–8 (clockwise from lower left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (L 842913 !); Specimens 9–11 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (L 842914 !); Specimen 14, Nepalia, Wall. Cat. 1510, Wallich s.n. (L 842862 !); Specimens 1–3 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich

s.n. (G 177188 !); Specimens 4–7 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (G 177189 !); Specimens 8–9 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (G 177190 !); Specimens 1–5 (clockwise from lower left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (K !); Specimens 1–7 (clockwise from upper left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (PH 3215 !); Specimens 1–6 (clockwise from lower left), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (NY 388325 !); Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (E 314326 !); Specimens 2–4 (from left to right), Nepalia, 1821, Wall. Cat. 1510, Wallich s.n. (E 314328 !).

Anisadenia khasyana Griff., Not. Pl. Asiat. 4: 534 (1854); Itin. Pl. Khasyah Mts. 38, no. 623 (1848); Icon. Pl. Asiat. t. 593 (middle figure) (1854); Kanjilal & al., Fl. Assam 1: 186 (1936). Type: INDIA. Meghalaya, Mamloo et Churra Pongee (Cherra Punjee) Collum Khasyensium (Khasia), Oct. 27, 1835, Griffith s.n. (this specimen is not traceable; the middle figure in Griffith's Icon. Pl. Asiat. t. 593 [1854] could be served as lectotype).

Note: Wallich (1829: 41, 249) first named and catalogued *Anisadenia saxatilis* based on collection (Wall. Cat. 1510) made by him during botanical excursion to Nepal (Wallich 1830) during 1820–1822 and on Robert Blinkworth's collection from Kumaon (Wall. Cat. 1510 B). However, Wallich failed to publish it validly though he had tried to do so as evident from Meisner's (1838) notes that first validate Wallich's name for this taxon. He described this plant based on the collections by Wallich from Nepal and Blinkworth from East Kumaon, a high altitude region very close to the border between Nepal and India at eastern region of Uttarakhand, India. Since most of the Wallich specimens were transferred to many of the European herbaria during his superintendentship at Indian Botanic Garden, Howrah in late 1828, efforts have been made to procure high resolution images of original specimens from P, OXF, L, G, K, PH, NY and E. It was found that



Fig. 2. Lectotype of *Anisadenia saxatilis* Wall. ex Meisn. (E. Kumaon, R. Blinkworth s.n., CAL 6759).

there are three sheets belonging to Wall. Cat. 1510 deposited each in the herbaria of P, L and G; two sheets of Wall. Cat. 1510 in E and one sheet of Wall. Cat. 1510 each in OXF, K, PH and NY. However, there were two sheets from K in which both Wall. Cat. No. 1510 and Hooker f. and Thomson's annotation slips were found and it is very difficult to consider it as original material for typification. Hajra (1983) wrote "Type: Sheopore, Aug. 1821 (CAL)", thereby designating Wallich's collection from Nepal deposited at CAL as a type, the first step of typification. Thorough study of all the images of type sheets and critical evaluation based on these type images available with original specimens housed at CAL were further made to lectotypify *A. saxatilis*. Since the Kumaon specimen collected by Robert Blinkworth deposited at CAL is in good condition and made available to us for proper study for matching with the protologue, the specimen 'No. 2' here must be chosen for lectotypification.

This species is so far reported from India (Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Uttarakhand), Nepal, Thailand, China, Bhutan and Myanmar (Hajra 1993, Li and Zhou 2008).

Anisadenia pubescens Griff., Itin. Pl. Khasyah Mts. 54. no. 833 (1848); Not. Pl. Asiat. 4: 535 (1854); Icon. Pl. Asiat. t. 593 (right hand figure) (1854); Hook. f., Fl. Brit. Ind. 1: 413 (1874); Kanjilal & al., Fl. Assam 1: 187 (1936); Hajra, Fasc. Fl. Ind. 13: 2 (1983) & Fl. Ind. 3: 573 (1993).

Lectotypus (designated here): Specimen 'No. 4' (from left to right). INDIA. Meghalaya, Khasia, W. Griffith s.n. (CAL 6449 !). [Fig. 3]

Syntypus: Specimen 'No. A-B'. India. Meghalaya, Khasia, Griffith s.n. (K !); Specimen No. 1–3 (from left bottom to right), India, Meghalaya, Khasia, Griffith s.n. (CAL 6449 !); Specimens 5–7 (clockwise from lower left), India, Meghalaya, Griffith s.n. (P 689863 !).

Note: The name *Anisadenia pubescens* was

first validly published by Griffith (1848) based on his own collections from Boga Panee (Bora Pani) and Moflong, both from the Khasia region of Meghalaya. Since most of his collections are now at CAL, K, ASSAM, P and BR, efforts were made to procure high resolution images of original collections made by Griffith. While scrutinizing the type collections from different herbaria, we found that one sheet of Griffith collection from Khasia is deposited each at CAL, K and Hajra (1983) wrote "Type: Khasia, Herb. Griffith s.n. (CAL)", thereby designating Griffith material at CAL as potential lectotype material. After a critical study and matching the specimen with protologue, the specimen 'No. 4' at right side of the sheet deposited at CAL was chosen for the second step in lectotypification (cf. Art. 9.15 of the Code).

This species is so far reported from India (Arunachal Pradesh, Manipur, Meghalaya, Nagaland), Nepal, Bhutan and China (Hajra 1993, Li and Zhou 2008).

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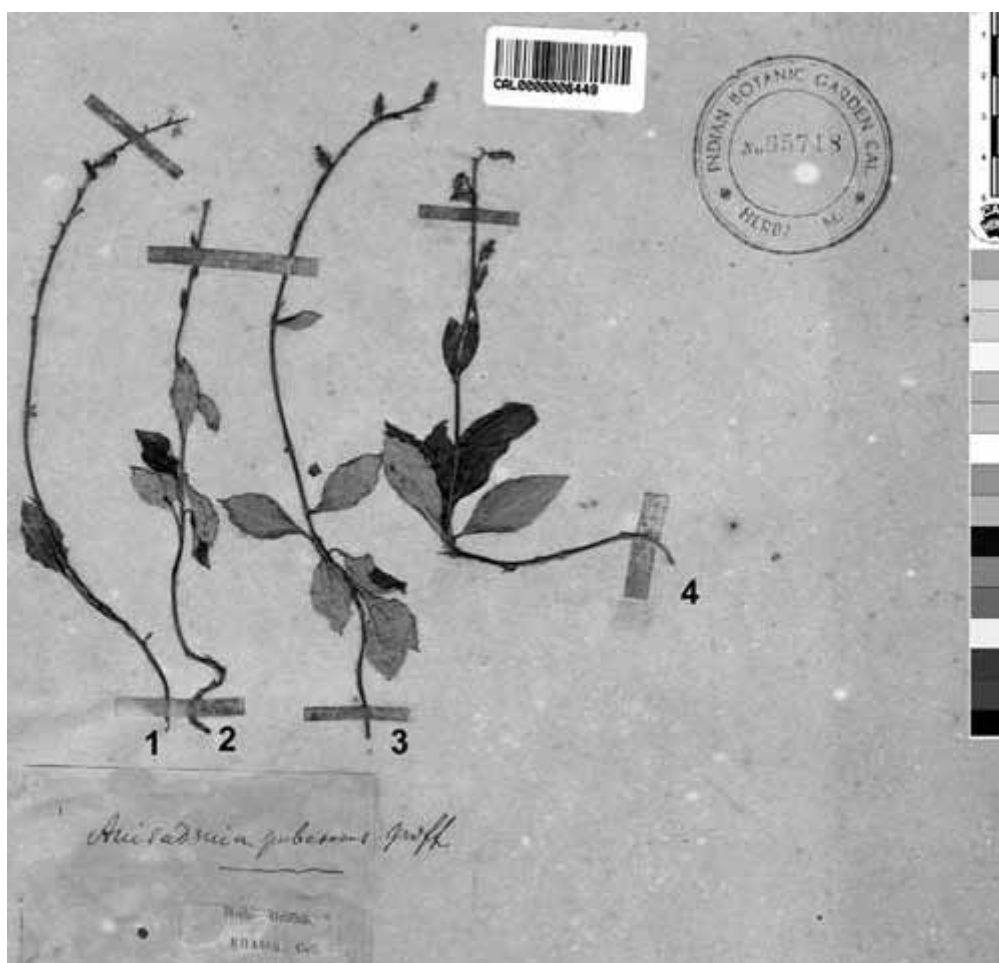


Fig. 3. Specimen 4 was chosen as lectotype of *Anisadenia pubescens* Griff. (Khasia, W. Griffith, CAL 6449)

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S. K. スリヴァスタヴァ*, G. K. ウパディアイ, G. クリシュナ: *Anisadenia* (アマ科) のインド産種のレクトタイプ選定と分類学的ノート

アマ科 *Anisadenia* のインド産の種を改訂し, *A. saxatilis* Wall. ex Meisn. と *A. pubescens* Griff. のレクト

タイプ選定を行った。さらに、検索表を付けこれらの2種の区別点を明らかにした。

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